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UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANT:	Loprete	GROUP ART UNIT:	3746
SERIAL NO.:	09/090,358	EXAMINER:	Torrente, D.
FILED:	June 4, 1998		

FOR: SCROLL COMPRESSOR WITH MOTOR CONTROL FOR CAPACITY MODULATION

ATTORNEY DOCKET NO.: 60,298-038

Box AF
Assistant Commissioner of Patents
Washington, D.C. 20231

APPEAL BRIEF

Dear Sir:

Subsequent to the filing of the Notice of Appeal 22 May 2000 Appellant now submits its brief. Fees in the amount of $300 are paid by the attached check.

Real Party in Interest

The real party of interest is the Assignee in its entire right in this application, Scroll Technologies.

Related Appeals and Interferences

There are no related Appeals or Interferences.

Status of Claims

Claims 9-11 are withdrawn from consideration. Claims 8 and 15 are objected to as being dependent upon a rejected claim, but as otherwise being allowed. Claims 1-7, 12-14 and 16-20 are rejected under 35 U.S.C. §103.

Status of Amendments

No amendments after Final Rejection have been submitted.

Summary of the Invention

This application relates to scroll compressor embodiments such as are shown in Figures 1-4. Figures 5-8 are drawn to a non-elected embodiment.

In the Figure 1 and 2 embodiment when the scroll compressor is rotated in a first normal direction, a roller clutch 44 drives a driveshaft 30 in a forward direction. A roller clutch 40 allows a planet gear carrier 36 to free wheel on a crankcase 42. Thus, motor rotor 26 and shaft 30 rotate at about the same speed and an orbiting scroll 24 is driven through an eccentric 48 of the shaft 30. A scroll compressor is operated in this forward direction to compress a refrigerant, as known.

The present invention has disclosed and claimed a unique method of modifying the capacity of the refrigerant which is compressed by changing the motor speed. Thus, in the claimed embodiment, the motor 26 can be caused to rotate in a reverse rotation. Rotor clutch 44 now will not drive shaft 30. A ring gear 38 will rotate the planet gears 34, and the planet gears will try to rotate the planet gear carrier 36. However, the clutch 40 will not allow slipping between a planet gear 36 and a crankcase 42 when driven in this direction. Thus, the planet gears 34 do not orbit about the shaft 30, and instead a sun gear 32 is driven. A gear reduction is provided between a ring gear 38, planet gears 34 and the sun gear 32, and thus there is a reduction in the speed of the shaft 30 relative to the rotor 26. This difference in speed will then change the amount of refrigerant which is compressed in the compressor.

Figure 3 shows a second embodiment wherein when a shaft 56 is driven in a forward direction, a roller clutch 68 transmits rotation directly to an eccentric 70. An orbiting scroll 54 is then driven at a particular rate. A clutch 58 will slip and allow a planet gear carrier to freewheel on the portion 61. When reverse rotation occurs the roller clutch 58 will no longer permit freewheeling rotation. Thus, the shaft 56 and the sun gear 66 will drive the planet gear 62. However, the planet gear 62 only rotate about the mount 63 on the carrier 60. Since, the carrier 60 is locked to the portion 61 by the clutch 58. Thus, the eccentric 70 will be driven with its fixed ring gear 54 with a gear reduction being achieved.

Issues

Is the combination of the Sisk, et al. and Wallace patents proper to reject the claims?

Does the combination, even if proper, still meet limitations of several of the claims with regard to the drive transmission path?

Grouping of Claims

The rejection of Claim 1-7, 12-14 and 16-20 is contested as being improper.

The rejection of Claims 16-20 is separately contested. That is, the rejection of these claims does not stand or fall with the rejection of the other claims.

Argument

The combination of the Sisk, et al. and Wallace patents is improper

The Examiner holds the Sisk, et al. patent can be combined with the Wallace patent such that Sisk, et al. is driving a scroll compressor as is disclosed in Wallace. This combination is improper, and further would not meet the claims at any rate if proper.

Further, the rejection of all Claims is improper even if the combination of the references is accepted. Both Claims 1 and 12 recite that when the compressor is driven in the forward direction it will rotate at a speed which approximates the motor speed. In Sisk, et al., drive in this direction passes through a planetary transmission, and the speed of the compressor member will not necessarily bear any relationship to the motor speed. As such, the combination, even if proper, would still not properly reject these claims.

Scroll compressors are a very specific and highly defined area of compressor technology. In a scroll compressor, an orbiting scroll member is driven in a particular direction relative to a non-orbiting scroll member. A major feature of scroll compressor design is the elimination of any rotation in a reverse direction from this forward direction. A scroll compressor designer would not like the scroll member to rotate in the improper direction, as this is undesirable and potentially detrimental. Many patents are directed to eliminating any such reverse rotation. As such, it is not "suggested" to modify a scroll

compressor in a reverse direction to achieve some capacity modulation. A worker in this art would not see the Sisk, et al. reference as relating to scroll compressors for this reason. Thus, the proposed combination is improper and must be withdrawn.

The Rejection of Claim 16-20 is Separately Improper

Each of these claims specifically recite that there is a one way clutch between the rotary motor and the second scroll such that when the motor is driven in the forward direction, the transmission will not affect the speed of movement of the second scroll. The claims specifically recite that when the motor is driven in the forward direction, the one way clutch ensures the drive is not passed through the transmission, but that when the motor is driven in the reverse direction the one-way clutch will ensure the drive passes through the transmission.

The Sisk, et al. reference does not meet this limitation. In Sisk, et al. drive in either direction will pass through the planetary transmission. Thus, Sisk, et al. does not have an arrangement which can meet these claims. Even accepting the combination of Wallace with Sisk, et al. is proper, the combination will still not meet these limitations of the claims.

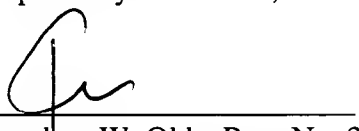
The Examiner argues that since the transmission in Sisk, et al. is located between the motor and compressor, drive in either direction will nominally pass "through" the planetary transmission. This ignores the limitations with regard to the drive passing "through" in one direction but not the other, and further ignores the limitations with regard to the function to the one-way clutch. Moreover, this interpretation completely ignores the description of a drive passing through a transmission as is used in this art.

There is no support for the rejection of Claim 16-20, and it is completely improper.

Closing

For the reasons set forth above, the rejections of all claims is improper and must be reversed. Appellant respectfully asks for such an action.

Respectfully Submitted,



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Dated: July 13, 2000

CERTIFICATE OF MAILING

I hereby certify that the attached Appeal Brief is being deposited in triplicate with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to Box AF, Assistant Commissioner of Patents, Washington, D.C. 20231, on this 13th day of July, 2000.

Laura Combs

CLAIMS APPENDIX

1. A scroll compressor comprising:

a first scroll;

a second scroll being driven for orbital movement relative to said first scroll;

a reversible electric motor, said motor being operable to be driven in one direction at a first speed of rotation and cause said orbiting scroll to cyclically orbit in a forward direction at a first rate which is approximately equal to said first speed, and said motor being operable to be rotated in an opposed direction at said first speed, said orbiting scroll being caused to move in said forward direction when said motor is driven in said opposed direction at a rate which is different from said first rate by a mechanical transmission.

2. A scroll compressor as recited in Claim 1, wherein said different rate is lower than said first rate.

3. A scroll compressor as recited in Claim 1, wherein said mechanical transmission includes a gear transmission which varies the speed of said motor to said orbiting scroll.

4. A scroll compressor as recited in Claim 3, wherein said gear transmission provides a gear reduction.

5. A scroll compressor as recited in Claim 4, wherein said gear transmission is a planetary gear transmission.

6. A scroll compressor as recited in Claim 5, wherein roller clutches selectively transmit rotation from a motor shaft to said orbiting scroll when said shaft is driven in said one and said opposed directions.

7. A scroll compressor as recited in Claim 3, wherein said gear transmission is provided between a shaft portion and an eccentric mounted between said shaft and said orbiting scroll.

12. A scroll compressor comprising:

a first scroll member having a base and a scroll wrap extending from said base;

a second scroll member having a base and a scroll wrap interfitting with said first scroll wrap;

a bi-directional rotary motor for driving said second scroll relative to said first scroll, said motor being driven in a forward direction and in a reverse direction, said motor being driven at a first speed in said forward and reverse directions; and

a mechanical transmission for driving said second scroll in said forward direction when said motor is driven in both said reverse and forward directions, and at a speed which approximates the speed of said motor when said motor is driven in said forward direction, and said transmission reducing the speed of movement of said second scroll when said motor is driven in said reverse direction.

13. A scroll compressor as recited in Claim 12, wherein said transmission includes a planetary gear transmission.

14. A scroll compressor as recited in Claim 13, wherein said planetary gear transmission is mounted between a shaft and an eccentric portion.

15. A scroll compressor as recited in Claim 13, wherein said planetary gear transmission is mounted between a shaft and a motor rotor.

16. A scroll compressor as recited in Claim 12, wherein a one-way clutch connects said rotary motor to said second scroll when said motor is driven in said forward direction, such that said transmission does not affect the speed of movement of said second scroll when said motor is driven in said forward direction, and said one-way clutch allowing relative rotation between said motor and said second scroll member when said motor is driven in said reverse direction such that the drive of said second scroll by said rotary motor passes through said transmission when said motor is driven in said reverse direction.

17. A scroll compressor as recited in Claim 1, wherein a one-way clutch connects said rotary motor to said second scroll when said motor is driven in said forward direction, such that said transmission does not affect the speed of movement of said second scroll when said motor is driven in said forward direction, and said one-way clutch allowing relative rotation between said motor and said second scroll member when said motor is driven in said reverse direction such that the drive of said second scroll by said rotary motor passes through said transmission when said motor is driven in said reverse direction.

18. A scroll compressor comprising:

a first scroll member having a base and a scroll wrap extending from said base;

a second scroll member having a base and a scroll wrap interfitting with said first scroll wrap;

a shaft operably connected to drive said second scroll member to orbit relative to said first scroll member;

a bi-directional rotary motor for driving said shaft to in turn drive said second scroll relative to said first scroll, said motor being driven in a forward direction and in a reverse direction; and

a one-way clutch for connecting said motor and shaft to drive said second scroll when said motor is driven in one of said forward and reverse directions, and a mechanical transmission for affecting the speed of movement of said second scroll when said motor is driven in a second of said forward and reverse directions, said one-way clutch allowing said motor and shaft to drive said second scroll when driven in one of said forward and reverse directions without passing through said transmission, and said one-way clutch allowing relative movement between said second scroll and at least one of said rotary motor and said shaft when said motor is driven in said second of said forward and reverse directions.

19. A scroll compressor as recited in Claim 17, wherein said one of said forward and reverse directions is a forward direction.

20. A scroll compressor as recited in Claim 18, wherein said transmission includes a planetary gear transmission.

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